# BULLETIN

*of the*

## ONTARIO COLLEGE OF PHARMACY

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"In a world of rapid change and a tremendous increase of knowledge, it is essential that a professional man continue his education as long as he remains active in his profession". Lloyd E. Blauch, Chief for Education in the Health Professions, Office of Education, Department of Health, Education and Welfare, Washington, D. C.

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"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." Constitution of the World Health Organization.

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### The New Faculty of Pharmacy, University of Toronto

July 1st, 1953, will stand as an historic milestone in the progress of Ontario Pharmacy. For on this date by agreement with the Ontario College of Pharmacy, the new Faculty of Pharmacy of the University of Toronto was established. By the terms of the agreement the Ontario College of Pharmacy surrendered its statutory right to operate a school of pharmacy. The College will, of course, continue to function as the statutory licensing body for the province. (continued on page 37)

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The Bulletin of the Ontario College of Pharmacy is published by the Ontario College of Pharmacy. Members of the College are invited to submit articles and comments to the Editor.

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Portrait of Dean Emeritus R. O. Hurst
Presented to him by his friends at a dinner in his honour held June 3 in Hart House, Toronto. Dean Hurst presented the portrait to the College. The portrait was painted by Cleeve Horne.

## From the Registrar's Desk

There are two very important items that I would like to mention, namely, "Our New Relationship with the University of Toronto" and "The Status of the New Pharmacy Act and Food and Drug Legislation".

After some years of negotiation, the School of Pharmacy which had been conducted by the Ontario College of Pharmacy, as provided under the Pharmacy Act became a Faculty of the University of Toronto.

The School of Pharmacy as you knew it had been in operation for over eighty years. Since 1892 it has enjoyed affiliation with the University. After that time some of the lectures were given at the University and the University of Toronto conferred the degree. The teaching staff of the College was under the jurisdiction of the College Council. On July first the teaching staff was taken over entirely by the University.

The affiliation had been a very happy arrangement. However, the great advances made in the educational programs of Pharmacy and the related sciences made it imperative that a closer arrangement should be made that we might partake in full the advantages of being an integral part of this great University. The new relationship will be just as happy as the old and will be of untold benefit to Pharmacy in the expansive years ahead.

The College of Pharmacy will continue to license the Pharmacists in the Province and to administer the Pharmacy Act. To you practising pharmacists throughout the Province I suppose there will be little change apparent. To us at the College the change is very great. Since July first we have been working on the transfer of some duties and the assumption of new duties and routines.

The only members of the former staff who are still members of the College staff are myself, my assistant Miss Ward and the Inspector. Miss Ward and I hold dual positions with the College and the University carrying on the duties of Registrar of the Ontario College of Pharmacy and Secretary of the Faculty of Pharmacy. We are the links between the College and the University, and between those institutions and you, the practising pharmacists.

We hope the same happy relationship that has always prevailed between you and this office will continue. We will be glad to have you call and consider this office as your Pharmacy home in Toronto. We will be glad to hear from you, with or without your problems or difficulties. If you have problems in your practice we will do our best to find some one in the combined staffs who will try to help you.

Now, the Pharmacy Act, and the new Food and Drug Regulations:

A new Pharmacy Act was passed at the last session of the Legislature, in April. To date it has not received Royal Assent so that we are still operating under the old act.

The new regulations of the Food and Drugs Act, particularly those regulations dealing with the handling of Drugs listed in Appendices IV and V conflict with sections of the Pharmacy Act dealing with the same items. We receive many calls and letters asking for guidance. We have been endeavoring to obtain a ruling from the Department in this matter, without success.

Our Solicitor advises that we should follow the Regulations of the Food and Drugs Act until such time as a ruling is secured from the Departments concerned.

We have lately been able to obtain copies of the amendments to the Food and Drugs Act and will be glad to supply a set so that you may bring your copy of the Act up to date.

H. M. Corbett, Registrar-Treasurer

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## The Functions of Pharmacy

The time honoured definition of pharmacy is the making of medicines for the cure and alleviation of pain and disease. This definition is no longer adequate, not that pharmacy has ceased to be the making of medicines but the making of medicines has moved largely to factories where medicines are made under laboratory control by mass production methods.

If pharmacy is the making of medicines, then the maker is a pharmacist. We know that this statement is not the modern connotation nor the public usage. In former times, in truth, there were makers of medicines in the literal sense. Today, in the plant of a pharmaceutical manufacturer, no one person, single-handed makes a medicine. It is a collective operation, several persons and machines performing individual steps in the process. Division of labour or specialization of function is the rule. We cannot apply the term pharmacist to each person in a factory who performs some but not all of the functions necessary in the production of modern medicines. In the literal sense, the term pharmacist remains for those individuals who by qualification, are able, when called upon, to prepare medicines extemporaneously and these usually from factory prepared primaries.

In most countries the law adds other functions to the individuals who by qualification can prepare medicines extemporaneously and are therefore called pharmacists. Pharmacists are charged by governments with the proper distribution of medicinal agents considered dangerous to health unless prescribed by a physician for specifically diagnosed conditions. A license is granted by the state either through a state controlled board, or state grant of power to a professional group, to those individuals who by training are qualified to prepare medicines extemporaneously and whose integrity is such that the public interest is best served.

Gradually, in all modern states, a third function has been added, not by specific injunction in the law but by granting licensing bodies the right to examine and professional groups power to prescribe curricula for degrees. Today the pharmacist's thorough training in physiology, pharmacology, and pharmaceutical chemistry equip him to know the nature of the materials he handles and the relationship of such to the human body under both conditions of health and disease. The fact that these subjects are required study and passage of examination in them required for a university degree and a university degree is a prerequisite to licensing, makes this knowledge a legally mandatory function of the pharmacist.

The pharmacist is not qualified, legally or otherwise, to diagnose disease. But he is qualified to say which among several substances or remedies is most likely to be the best remedy for a stated condition. It is this function which is rapidly becoming a major function of the pharmacist. As the need for extemporaneous preparation of medicines diminishes, the need for guiding both the physician and the customer in the choice of factory prepared medicines increases. Second only to the dispensing and compounding of medicines, this giving of advice on a professional level at the proper time and place is a function which justifies the existence of the pharmacist in society.

H. J. F.

# Autonomic Drugs

Editor's Note:
This is the first of a series of short articles on Autonomic Drugs by Professor G. R. Paterson. Preserve them in your files.

## Part I - Introduction

The autonomic nervous system governs those body functions which are automatic. These functions include the activities of various glands, the involuntary movements of the heart and gastro-intestinal tract, and the control of the smooth muscles of the blood vessels, urinary bladder, bronchi and skin. Co-ordination of all body functions is accomplished by integration of the functions of the autonomic and somatic ( governing voluntary skeletal muscles ) systems in the central nervous system. Anatomically and physiologically, the autonomic nervous system is divided into two complementary parts, the sympathetic and the parasympathetic divisions.

Most organs innervated by the autonomic nervous system, are supplied with both sympathetic and parasympathetic elements. The condition of an effector site at any given time represents a delicate balance between the actions of the two divisions. A condition of health is dependent upon the maintenance of this fine state of equilibrium.

The sympathetic system consists of a series of ganglia (nerve centres) lying on either side of the vertebral bodies in the cervical, thoracic and upper lumbar regions, and serving to connect pre-ganglionic fibres and post-ganglionic fibres which pass to the viscera (the pupils, sweat glands, thyroid gland, salivary gland, heart, blood vessels, bronchi and lungs, liver, gastro-intestinal tract, bladder, etc.).

The vagus nerve and its ramifications form the most important part of the parasympathetic division. The vagus nerves arise in the medulla and consist of sensory and motor fibres. The sensory division supplies the mucous membranes of the respiratory tract, heart, base of the tongue, palate, pharynx, esophagus, stomach, duodenum, jejunum, ileum and the mucous membranes of the bile ducts. The motor division supplies the muscles of the soft palate, the constrictor muscle of the pharynx, muscle elements of the bronchi, larynx, liver and spleen, adrenals and kidneys as well as the esophagus, stomach and small intestine.

The autonomic nervous system is probably the most important route for transmitting the action of drugs in man. The most prominent drugs in this large group are classified as sympathomimetic and sympatholytic, and parasympathomimetic and parasympatholytic, as well as adrenergic and cholinergic stimulants and blocking agents. The first classification depends upon stimulation or depression of the sympathetic or parasympathetic divisions respectively. The second classification demands an understanding of the theory of chemical transmission of nerve impulses.

Nerve impulses travelling along both parasympathetic and sympathetic preganglionic fibres cause the release of acetylcholine, which transmits the impulse by an unknown mechanism across the synapse (junction between the sections of a nerve ) to the postganglionic fibres. Impulses travelling along the sympathetic postganglionic fibres liberate sympathin ( a mixture of epinephrine and norepinephrine ) at the myoneural junction. Impulses travelling along the parasympathetic postganglionic fibres release acetylcholine at the nerve endings. Acetylcholine is destroyed at the synapses and at nerve endings by the action of an enzyme. Cholinesterase and sympathin may be destroyed in similar manner by another enzyme. Acetylcholine is

also liberated at the endings of a few sympathetic postganglionic fibres, notable the sweat glands and pilomotor muscles ( hair movements ). Nerve endings at which acetylcholine is liberated are termed cholinergic. Those at which sympathin is released are called adrenergic. Drugs may then be classified according to their stimulation or depression of either type of nerve fibre.

Since acetylcholine is liberated at the synapses as well as at the postganglionic nerve endings of all parasympathetic and some sympathetic fibres, there are two distinct groups of responses to administration of acetylcholine. Effects at the ganglionic synapses are similar to those obtained with nicotine ( the tobacco alkaloid ) and are described as the nicotine effects of acetylcholine. Effects at the postganglionic cholinergic nerve endings are similar to those observed with muscarine ( an alkaloid of the mushroom, Amanita muscaria ), and are termed the muscarinic effects of acetylcholine. Nicotinic effects are abolished by curare; muscarinic effects by atropine.

(To be continued) G. R. P.

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## Sodium Carboxymethylcellulose

The Hercules Powder Co. of Wilmington, Delaware, market a number of cellulose derivatives such as Nitrocellulose, Cellulose Acetate, Ethyl Cellulose, Cellulose Gum. In this brief paper some of the features of Cellulose Gum will be presented. (1) (2).

CMC ( carboxymethylcellulose)is a water-soluble ether of cellulose and is known as Cellulose Gum or Sodium Carboxymethylcellulose. Cellulose is first treated with alkali and then reacted with sodium monochloroacetate to form the water soluble sodium salt. It is supplied as a fibrous or granular powder,light-cream to white in colour and appears on the market as CMC-70, low, medium and high viscosity. There are other types available but the regular purified type, Hercules CMC-70 is of more interest to the pharmacist at the moment as a suspending agent.

Solutions are readily prepared in hot or cold water but it is desirable to disperse the dry fibres as much as possible which speeds the swelling of the individual particles. For this reason, constant stirring helps and a small mixer is very useful. Heating the water helps but stirring is more important.The greater the shearing action the better the solution and colloid mills are indicated where possible. Stock solutions of from 5 to 10% may be prepared by dispersion and then diluted with water to the desired concentration with less vigorous stirring to avoid the entrapment of air. These solutions should be preserved, and liquefied phenol 0.1% v/v is recommended. CMC is generally used in concentrations of 1 to 2% as a suspending agent.

Goldstein has done considerable work on this subject and his original investigations were concerned with calamine lotion. It has been made pretty well universally with bentonite as the suspending agent but there have been complaints from dermatologists that it is very thick and does not pour easily, clogs the orifice, etc. and even those with polyethylene glycol 400 monostearate and the polyethylene glycols have apparently had some shortcomings. One of the biggest objections is the fact that many calamine lotions are incompatible with phenol. Various suspending agents have been used but they either foam too much or react with phenol (3).

Goldstein decided to try CMC 2% of the medium viscosity type. It would not wet and spread on the skin too well and to overcome this Aerosol OT was added. This wetting agent appeared superior to others such as sodium lauryl sulphate and Tween 80 and did not react with phenol. The resultant lotion spread easily and soothingly on dry or moist skin and dried in several minutes to form a protective film which did not easily rub off but which washed off readily and completely with cold water.

| | |
|---|---|
| Calamine Lotion | 80 |
| Zinc Oxide | 80 |
| S.C.M.C. medium | 20 |
| Aerosol | 0.65 |
| Glycerin | 30 |
| Water | 960 |

Dissolve the CMC in 600 cc. of water with vigorous stirring, then with slower stirring add 285 cc. water, then add the aerosol previously dissolved in 65 cc. of water. Rub the calamine and the zinc oxide to a smooth paste with the glycerin and about 40 cc. of the prepared suspension base, then add the remainder of the base in portions with trituration after each addition or slowly with continuous trituration.

Aerosol is official in the N.F. 9 and is an unctuous, hygroscopic, translucent pellet which swells and dissolves in water much like glycerin. A 1% solution can be prepared by occasional inversion of a bottle containing the solute and water during an 8 hour period or by letting it soak over night and then occasionally agitating.

The cellulose is quite soluble in water but must be added gradually to avoid the formation of lumps that dissolve very slowly. The rapidity of dispersion depends more upon the rate of stirring than upon the temperature and hence mechanical mixing is valuable. When diluted with water,less stirring or shaking is advisable since air might be entrapped. If a stock solution is desired it is better to have a preservative, and for this purpose, 0.1% phenol is satisfactory. The lotion base is easily prepared if a stock solution of aerosol is on hand.

Goldstein continued his work with the object in mind of using a concentrated preparation for ointments and a dilute one for lotions (4). He suggests that the suspension vehicle be made with 2 to 2.1% CMC and 0.65% Aerosol. Simply mix the CMC water at room temperature for 3 to 5 minutes or in a blender for 1 or 2 minutes. The following is a formula for a stock vehicle:

| | | |
|---|---|---|
| SCMC medium | 21 | Gm. |
| Water | 935 | cc. |
| Aerosol (1% solution) | 65 | cc. |
| Liquefied Phenol | 1 | cc. |
| Tween 20 | 0.3 | cc. |

Place 700 cc. of water in the mixing vessel, start the mixer and add the CMC slowly and stir until clear. Add the remaining 235 cc. of water, 65 cc. Aerosol, phenol and Tween 20, mix and bottle.

For extemporaneous work it is suggested that the medicinal agent be mixed with enough glycerin to have 3% v/v glycerin in the final product and enough of the vehicle to form a smooth paste, and then made up to volume with additional vehicle. At least 5cc. more than the volume should be prepared in order to allow for loss in transferring from one container to another.

For insoluble powders the mortar and pestle are recommended while for coal tar, thymol in alcohol, mere mixing in the bottle. For medicines with alcohol in solution form it is not necessary to use glycerin. Glycerin does eliminate drawing of the treated surface while the lotion film is drying.

D. S. Anderson and J. W. Hadgraft have suggested that a suspension of titanium dioxide is most efficacious for the treatment of eczema when applied in an acid base and Goldstein suggests a buffered preparation to meet this requirement:

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|---|---|
| SCMC | 20 Gm. |
| Disodium Phosphate | 10 Gm. |
| Citric Acid | 10 Gm. |
| Aerosol (1% solution) | 65 cc. |
| Water | 935 cc. |
| Liquefied Phenol | 1 cc. |

Glycerin, 30 cc. is added with the medicinal agent unless it is expressly omitted from the final product. Dissolve the phosphate and citric acid in 235 cc. of water and add the solution to the CMC dispersed in 700 cc. of water, then add the aerosol and liquefied phenol. A stock buffered vehicle can be prepared by the addition of 0.12% v/v Tween 20 to the buffered vehicle. There is more separation with the buffered vehicle but resuspension is easy. The parabens can be used as preservatives. Opalescence with the aerosol is due to non-solution. For the unbuffered vehicle, 0.03% Tween 20 is recommended. The addition of 2% phenol causes opalescence with the stock vehicle but not with the extemporaneous one.

All the products form films and the drying takes about 3 to 5 minutes. Glycerin and alcohol counteract the drawing during film formation unless the material is applied too liberally. Alcohol, menthol and camphor increase the cooling sensation. The films can be removed by gentle washing with water but this does not remove the medicinal agent if it has been absorbed or adsorbed from the film.

There are incompatibilities. Aluminum, iron and lead salts react. Bismuth subnitrate causes gelatinization but bismuth subcarbonate and bismuth subgallate form excellent suspensions. Salicylic acid and benzoic acid in greater concentration than 5% cause thickening and difficulty in pouring but the tendency is reduced if other substances are added. It should be useful for powders and water soluble chemicals. Sulphur 5% separates and is difficult to redistribute as are also talc and benzocaine.

Goldstein continued this work by considering ophthalmic ointments (5). Swan and Friede have stated that oils and greasy ointments do not allow an even application of ophthalmic drugs. The vehicles do not mix with conjunctival secretion and do not adhere uniformly to the serous surfaces of the conjunctiva and cornea thus preventing the ointment acting as a protective film over the eyeball when such protection is desirable. Jellies, mucilages, alginates, swelling carbohydrates, methyl cellulose, etc. have been recommended. Shelanski and Clark have found sodium carboxymethylcellulose non-antigenic and non-irritating to the human skin and mucosa. This substance forms a gelatinous mass above a concentration of 5%.

Goldstein prepared several formulas and used glycerin or sorbitol powder:

| | | | |
|---|---|---|---|
| SCMC | 12 | SCMC | 6 |
| Glycerin | 25 | Sorbitol | 12.5 |
| Chlorbutanol | 1 | Chlorbutanol | 0.5 |
| Distilled Water | 18 | Distilled Water | 90 |

The procedure is straightforward and all preparations had a pH of about 6.9. Merely mix the glycerin or sorbitol with the CMC in a jar. Dissolve the chlorbutanol in water and add to the jar and shake vigorously for 1 minute, then shake occasionally until a thick, clear gel is obtained. Rub on a tile or in a mortar until smooth. The hot chlorbutanol solution aids in dispersion.

He prepared many ointments using the bases and found the majority of them satisfactory. Physostigmine and the sulfa drugs must have sodium bisulfite with them in order to prevent discoloration. The glycerin and sorbitol prevent rapid drying and film formation on the tile, in the jar, on extrusion, and on the eye. There is apparently a depot effect in the eye with CMC. The substance gives prolonged contact, protective films and is emollient. The transparency of the film permits examination of the eye and does not interfere with the patient's sight.

Heavy metal compounds are incompatible, i.e. mercuric oxide or organic mercurials. If boric acid is to be included, the glycerin and sorbitol must be ommitted in order to prevent acid reaction.

References

1. Hercules Cellulose Gum, Hercules Powder Co., Wilmington, Delaware (1949)
2. Properties and Uses of Hercules CMC, Hercules Powder Co., Wilmington, Del.(1951)
3. Goldstein, Samuel W., J. Amer. Pharm. Assoc. 13, 250 (1952)
4. Goldstein, Samuel W., J. Amer. Pharm. Assoc. 13, 550 (1952)
5. Goldstein, Samuel W., J. Amer. Pharm. Assoc. 13, 710 (1952)

G. C. W.

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## Council Elections

This was "election year" at the College, and members of Council for the coming two years are listed below -

| | |
|---|---|
| District 1 | A. F. Astley, Ottawa |
| District 2 | Lieut.-Col. F. C. Curry, Brockville |
| District 3 | D. W. Kemp, Ajax |
| District 4 | C. P. Taylor, Toronto |
| District 5 | V. L. Mutton, Toronto |
| District 6 | G. G. Caldwell, Barrie |
| District 7 | W. J. Abell, Brampton |
| District 8 | W. S. Luton, Hamilton |
| District 9 | Lieut.-Col. R. W. Meikleham, Galt |
| District 10 | P. T. Moisley, Timmins |
| District 11 | F. W. Milburn, Woodstock |
| District 12 | R. J. Ellinghausen, Owen Sound |
| District 13 | L. C. Gubb, Windsor |

New members on the Council for the coming session are - Mr. Kemp, Mr. Mutton, and Mr. Ellinghausen.

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## Rubbing Alcohol

The following communication has been received from the solicitor of the Liquor Control Board of Ontario:

"As you are no doubt aware, the Department of National Revenue, Customs and Excise Division at Ottawa, has now passed amending regulations which remove from restriction the sale of the above named commodity. Under these new regulations retail druggists will no longer be required to obtain a signature from his customer for the sale of rubbing alcohol. The matter has been discussed by the Liquor Control Board of Ontario and it has been decided that this Board will also remove restrictions from the sale of rubbing alcohol. This will mean the repeal of Regulations Nos. 121-129, both inclusive, passed by the Board under The Liquor Control Act. These Regulations are to be repealed and in the meantime the Board's inspectors have been instructed not to enforce them."

# Lipotropic Agents

Editor's Note:

This is the first of a series of articles by Professor R. M. Baxter designed to acquaint the pharmacist with the recent advances in the field of vitamins and hormones.

## Introduction

Since lipotropic means, in a literal sense, having an affinity for fats and fat-like substances it has come to be used as a designation for those substances which are concerned with the mobilization and transportation of fat, cholesterol, cholesterol esters and other substances associated with fat metabolism. Thus lipotropic agents may be considered to have a preventative or curative effect on the development of fatty livers, atherosclerosis and other allied conditions.

The existence of lipotropic agents was first realized during the early studies of the role of the pancreas in diabetes mellitus. In 1889 Minowski first observed that the removal of the pancreas resulted in the development of fatty livers. Little interest, however, was manifested in the action of the pancreas in preventing the development of fatty livers until 1924 when Fisher, at the University of Toronto, found that depancreatized dogs usually died, due to fatty infiltration of the liver, even though they were treated with insulin. Later studies showed that raw pancreas when fed to depancreatized dogs could prevent this fatty infiltration. It was observed that lecithin also exerted a lipotropic effect. In 1932 Best investigated the components of the phospholipid lipid molecule lecithin and found that the choline portion of the molecule was responsible for the above mentioned effect as well as the structurally related compound betaine. Thus the early development in this field was closely associated with the studies on insulin.

## General Considerations

In view of the role of lipotropic agents in fat metabolism a realization and understanding of certain pertinent facts concerning the utilization of fats by the body is necessary.

A large proportion of the fat contained in the diet is absorbed in a finely emulsified form from the small intestine by way of the lymphatic system, through the thoracic duct and into the blood where it appears as minute globules of neutral fat. A smaller portion is broken down into free fatty acids passing directly into the blood stream and thence to the liver.

The bulk of the absorbed fats find their way to the fat depots of the body where they are deposited unchanged. The small portion of the fat which has been broken down before absorption and entrance to the portal blood circulation, travels in a different form as part of a phospholipid molecule.

An example of a phospholipid, as mentioned earlier, is lecithin. It should be borne in mind that lecithin is only representative of one group of phospholipids and that a number of other types exist. All phospholipids, however, have certain characteristics in common and thus resemble lecithin. In contrast to fats which are esters of fatty acids and glycerol, phospholipids are esters of glycerol and two molecules of fatty acid with the third hydroxyl group of the glycerol esterified with phosphoric acid and a nitrogen containing compound. In the case of lecithin the nitrogen containing compound is choline.

In conditions where the carbohydrate ( glycogen ) reserves of the body are used up the depot fat is mobilized from the tissues and appears in the liver. This appears to be the first step in the utilization and breakdown of fats in the body. Thus it will be seen that any condition that interferes with carbohydrate metabolism will

cause an accumulation of fat in the liver. However, the amount of fat which is present, at any one time, is determined by the following factors:

(1) The amount of fat in the blood circulation of the liver.
(2) The ability of the liver to remove the fat from the blood and utilize it by oxidation or return it to the blood stream in a slightly changed form.
(3) The rate of synthesis of fat in the liver from other material.

Liver fat may exist as neutral fat in the form of phospholipids, glycerides, and cholesterol esters. In any condition where there is a development of fatty livers the fat may be present in any or all of the above forms.

My next article will deal with (1) the role of cholesterol in fat metabolism (2) lipotropic agents and their probable mechansim of action and (3) conditions in which lipotropic agents are of value.

R. M. B.

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## KSA (Key Sustained Action) Tablets

Inactive in the stomach but releasing the contents slowly and continuously for three to ten hours in the intestine, this new type of sustained action tablet has been patented by the Key Corporation to cover a plain, compressed, uncoated tablet which may contain either a plain, or highly complex formula or combination of active ingredients. These tablets have been tested by 116 physicians on 1,253 patients in a widely varied age grouping according to Drug Trade News of August 31, 1953.

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## Prescription Costing and Pricing Calculators

The Universal Prescription Costing and Pricing Calculator for all types of prescriptions has been developed by Prof. S. B. Jeffries, Brooklyn College of Pharmacy, and H. M. Soba, C.P.A. for Becton, Dickinson and Company, Rutherford, New Jersey. This is an excellent, quick and handy, simple to use calculator for finding the COST of any prescription. It does not give the PRICE. It tells you the cost and you add your professional fee. Free for the asking from Becton, Dickinson and Company.

Louis W. Yagel, the inventor, explained a new mechanical device for pricing any prescription at the section on practical pharmacy of the recent national convention of the American Pharmaceutical Association. The device is a slide rule with three slides which work individually and in conjunction with one another. They very simply calculate an accurate PRICE for any compound or "count and pour" prescription.

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## Teaching the Teacher

American Druggist reports that the Walgreen Drug Stores have just completed a 6 week drug store management seminar in Chicago to 12 pharmaceutical educators and indicates that 12 more pharmacy colleges will be invited to take part in a similar seminar next year. "Walgreen department heads led discussions of over 45 subjects - including store layout, merchandising, self-service, and inventory control." While pratical experience is a great teacher and all learning need not be formal, it is a question whether it is advisable for teachers to get their training from business concerns Would we consider the same program proper for the training of professors in the other subjects of the pharmacy curriculum? On the other hand, a high degree of cooperation between theory and the best in practice is always desirable.

Perhaps the key word is best. American Druggist reports "Walgreen Sells Parakeets, Frozen Foods"; "Walgreen Units May Sell Bread in 30 states if Test Succeeds"; "Walgreen Reports Income Off 21.2% in 1952 fiscal year despite 4.3% sales hike." Having visited many Walgreen stores and Walgreen Agency Stores in western United States this summer, I wonder?

H. J. F.

## Bulletin Recognition

Two articles in the March issue of the Bulletin have been reprinted in other publications. "For Better Public and Professional Relations" by Dean F. N. Hughes was reprinted in the American Journal of Pharmaceutical Education and "The Retail Pharmacist and the Small Hospital" by Mrs. I. E. Stauffer was reprinted in the March-April issue of the Hospital Pharmacist and also in the April 15 issue of the Canadian Pharmaceutical Journal. Truly, the Bulletin has come of age.

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## Scholarship

Miss Rosemary S. Bialek, of Oshawa, was awarded the War Memorial Matriculation Scholarship. This Scholarship, in memory of the graduates, undergraduates and apprentices who died in the S econd World War, was made possible by contributions of the graduates of the Ontario College of Pharmacy. This marks the sixth time the Scholarship has been awarded.

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## The New Faculty of Pharmacy, University of Toronto

(continued from cover)

It will not be easy for former graduates in pharmacy to refer to the new faculty except as the "O.C.P." An honourable tradition such as the College has established since its establishment in 1871 can never be forgotten. The system of education which our pharmaceutical pioneers established commencing in 1882 served its purpose admirably for some decades. During the latter part of the nineteenth and the early decades of the twentieth centuries the Ontario College of Pharmacy was in the forefront of Schools of Pharmacy on this continent. During the past ten years the College was guided by progressive policies which resulted in establishment of the four-year curriculum and enlargement of the teaching staff and substantial additions in the way of laboratory equipment and facilities. Consequently the University of Toronto has taken over in effect a progressive institution and not one which has yet to be built up. This will ever stand as a great credit to the pharmacists of Ontario.

There is not space herein to analyze all of the implications of this important move but it should be emphasized that under the aegis of the University of Toronto substantial benefits must accrue to the Profession of Pharmacy in this province and in effect in Canada. I am quite sure that pharmaceutical practitioners throughout Ontario must contemplate this change with feelings of pride. I am quite sure too that mingled with this pride will be a greater awareness of added responsibility resting upon each for now more truly than ever before will graduates both new and old be fully conscious that they are a part of the "University". In fact as graduates in Pharmacy we must all be aware of an unique dual academic loyalty. As we contemplate the full significance of this we realize more than ever before the essentiality of our full devotion to the professional aspects of the practice of pharmacy.

During past issues of this Bulletin we have been stressing the importance of public relations. Surely the establishment of the new Faculty of Pharmacy will constitute an effective stimulus to our public relations programme.

F. N. H.

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At a considerable saving we have deliberately neglected to punch the paper on which this issue of the Bulletin is printed. If you prefer punched paper in the future drop a postcard to the editor.

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